Winton Hart
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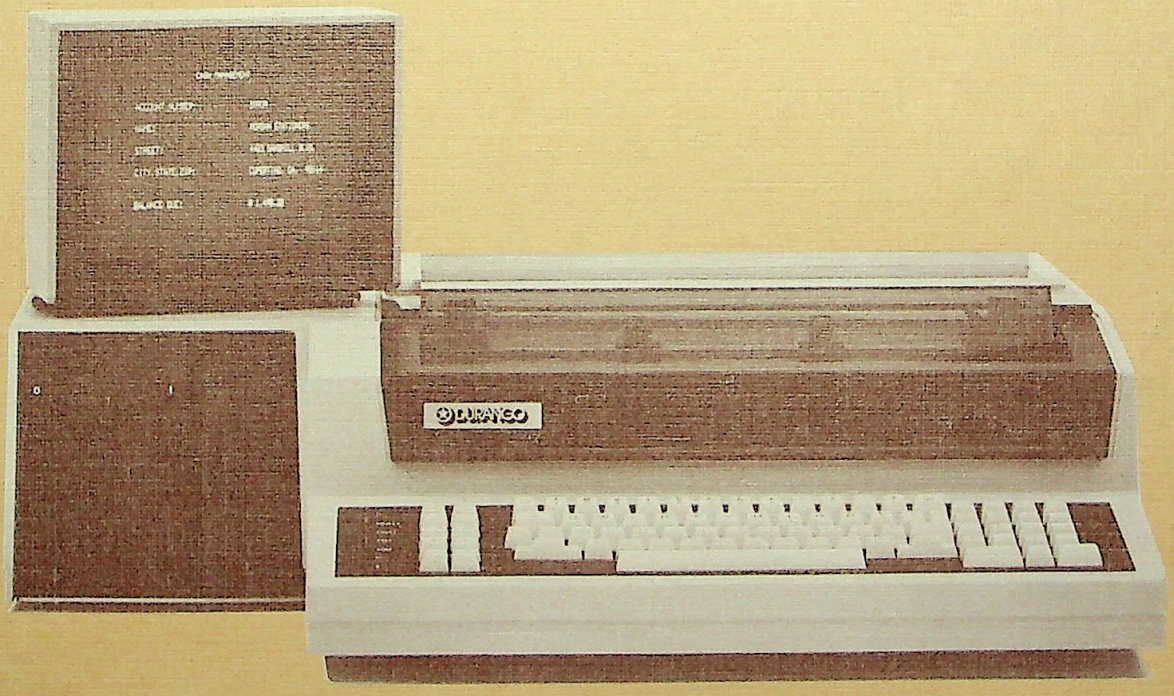
DURANGO

F-85

OPERATOR'S MANUAL



DURANGO

F-85

Operator's Manual

All information and specifications in this manual are current at the time of printing. However, because of **Durango's** policy of continual product improvement, we reserve the right to make changes at any time without notice.

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FOREWORD

Durango welcomes you to the age of the small big computer.

The F-85 is the first in its class of big computer power in a small desktop package: Big computer power means capability to do more **automatically;** the desktop package means all-in-one simplicity of operation. As a result, the F-85's totally integrated design and portability make installation and operation possible where conventional computer systems would be impractical.

With its design oriented to typical office activity, operation is unconventionally simple, straightforward, and easy to learn. Many of its unique features are automatically controlled by the system. In most cases, the display screen is used to actually guide the operator through step-by-step procedures.

This guide is organized into 4 major sections; a General Overview, Operation, Operator Maintenance, and Installation. Please read through each of the first three sections before installing and using the F-85.

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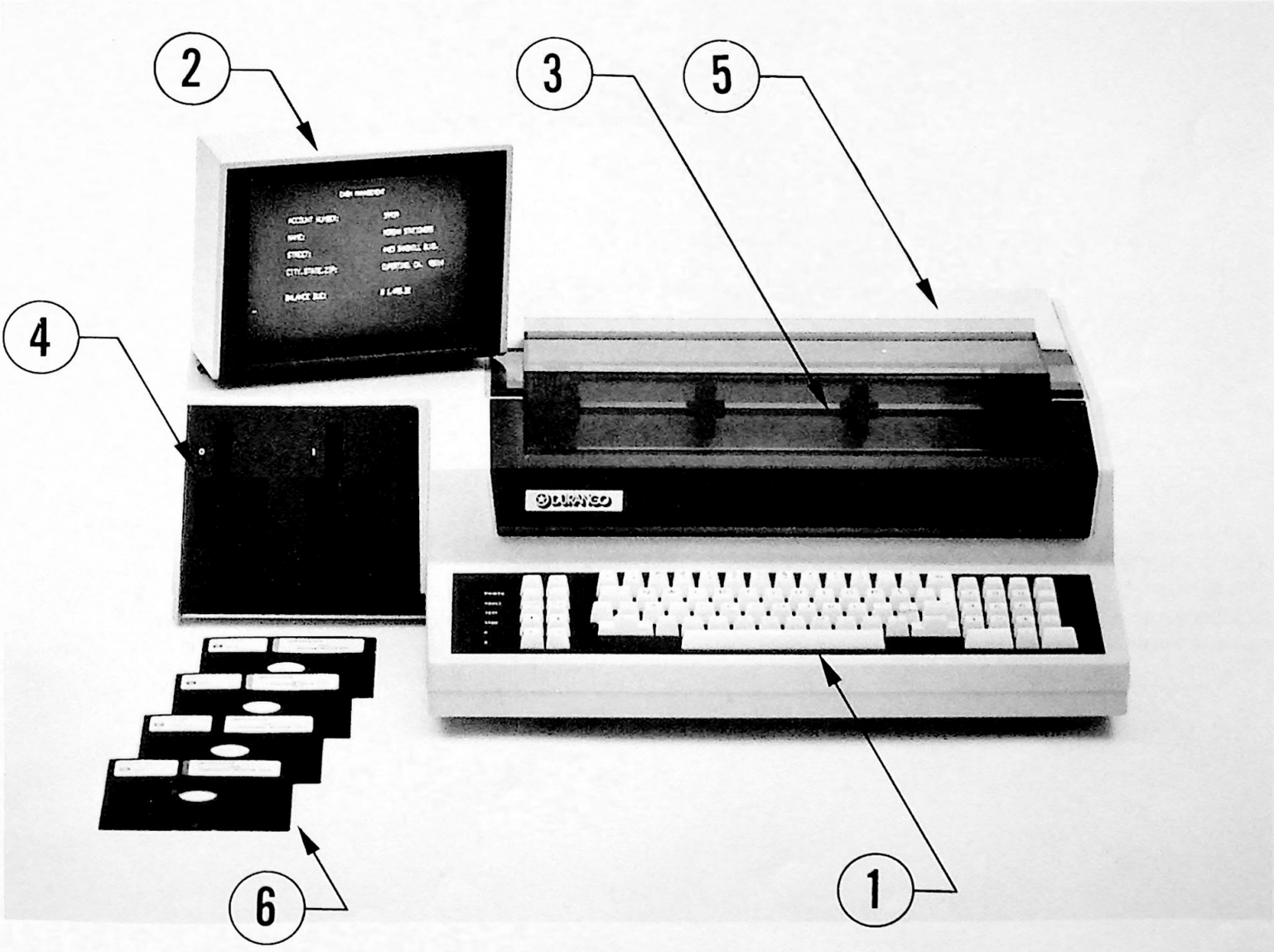
SECTION 1
INTRODUCTION

The F-85's unique all in one concept combines the elements needed to perform a wide variety of business information processing and/or data communication:

(1) Typewriter style keyboard for information entry and system control
(2) Video display unit for visual display of program instructions and entered information
(3) 165 character per second printer for "hard copy" printouts of reports, invoices, paychecks, etc.
(4) Dual diskette unit for program and record storage
(5) Processor unit
(6) Ready to use programs

In addition several unique features are built in that greatly enhance its ability to perform a wide range of jobs. Many of these features are controlled by the programs performing specific jobs (i.e., Accounts Receivable, Payroll, etc.) and are completely automatic in operation. This greatly reduces the time involved in learning to use the F-85. Similarly, all operator controls (except for the POWER switch) are located on the keyboard and logically grouped by function.

A brief overview follows to help familiarize you with the F-85's capabilities and operation.



1.2 KEYBOARD

The Keyboard is the primary method of operator/programmer input to the system. Using the familiar typewriter layout, it is designed for comfort and ease of use. Standard keyboard features include:

- Separate numeric pad
- Sculptured keytops (alpha-numeric section)
- Auto-repeat
- N-key rollover for maximum typing ease
- High reliability design
- Audio beep warning of error conditions

All system control (except the POWER switch and VDU BRIGHTNESS control) occurs via the keyboard. These controls, as well as system status indicators, are logically grouped into three major sections; alpha-numeric, control, and indicator.

The **alpha-numeric section** is similar to a conventional typewriter in operation, except for a few special keys. The adjoining numeric keypad is provided to assist in rapid entry of numeric data. Nearly all keys are provided with an auto-repeat function whereby a continuous stream of characters occur whenever the key is held depressed for more than one-half second.

The **control section** provides the means for controlling system functions such as printer paper positioning, stopping the output to the printer or video display, or loading the Operating System into main memory from diskette.

The **indicator section** provides indications of the F-85 status; power on, printer or VDU STOP, fault conditions, and specific error identification codes.

Some of the control and special keys in the alpha-numeric sections are provided for program development by application programmers. These keys are not used in normal system operation.

1.3 VIDEO DISPLAY UNIT

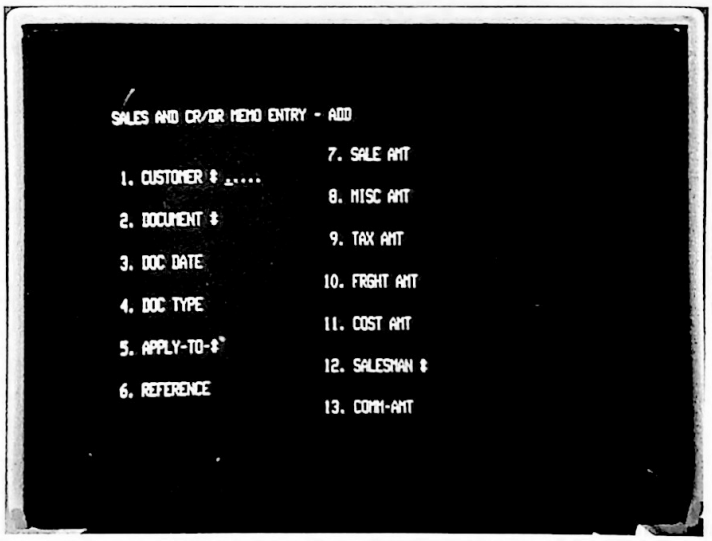
The integral Video Display Unit (VDU) is used to display keyed input, provide operator guidance and display output. As the principle operator feedback element in the system, several notable "human engineered" features are incorporated into its design:

- Program controlled display formats—24 lines of 80 characters each (1920 characters total) or 16 lines of 64 characters each (1024 characters total)
- Blink, reverse video, highlight, underscore and graphic display capability
- Swivel base CRT module

The dual display mode provision allows application program selection of the screen display format providing the most comfortable or appropriate display for the nature of the material being worked with. Whether the 16 line by 64 character display format or the 24 line by 80 character display is selected, the character size is altered to maintain best readability. Often application programs employ both display formats for enhanced operator convenience.

In situations where visual attention must be drawn to specific information, programmable blink, underscore, reverse video, or highlighting may be performed on any character or group of characters. Additionally, graphics capability is provided for straight line segment displays.

The VDU module consists of a 9 inch diagonal, low glare CRT located to the left of the keyboard. This arrangement maintains a single focal plane and minimizes eye travel between the screen and the working documents. A swivel base permits comfortable positioning to individual needs. An operator adjustable BRIGHTNESS control is provided at the rear of the module.



1.4 PRINTER

The F-85's integral Printer provides high definition matrix-type printout of reports, checks, invoices or other program results. Designed for high productivity, reliable operation, and minimal maintenance, the Printer features:

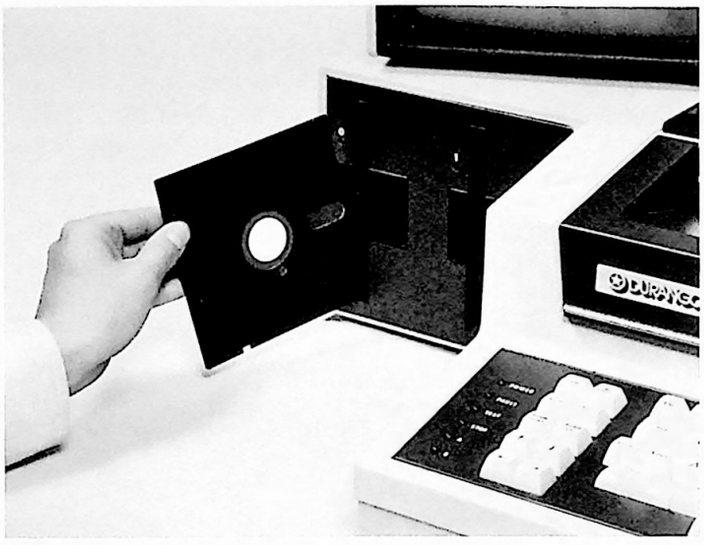
- Bi-directional printing at 165 CPS with upper/lower case capability
- High speed tabbing
- High resolution (9 x 9 dot matrix) print quality
- Integral form feed mechanism—accommodates forms from 3½" to 14⅜" hole-to-hole widths
- 10 or 16.5 character per inch spacing results in 132 or 217 printable characters per line selected under program control.
- Accommodates 6 part forms (. 020" maximum thickness)
- Adjustable form thickness control (print intensity adjustment)
- Keyboard control of paper positioning
- Long life printhead
- Long life, low cost, easily replaced cartridge ribbon

High throughput and reliable operation are attained through a microprocessor based controller. This approach provides "look ahead" capability minimizing carriage movement. Bi-directional printing is also employed.

From an operator standpoint, the Printer is designed for ease of use. The form feed mechanism is built in. Keyboard control of paper positioning further enhances ease of operation. The ribbon cartridge is drop in replaceable and will normally last at least a month (10 million character impressions).

The printer is capable of printing all capital letters, or of printing both UPPER and lower case letters. Its printing speed is about 165 characters per second in this demonstration, in which it is forming the characters with a 9 x 9 matrix of dots.

In addition to the standard 10 character per inch format, the F-85, under software control, prints in in THIS CONDENSED FONT, which gives 217 columns in a normal 13.2 inch print line. That's enough to do a financial report showing data for 12 months, row totals and descriptions!



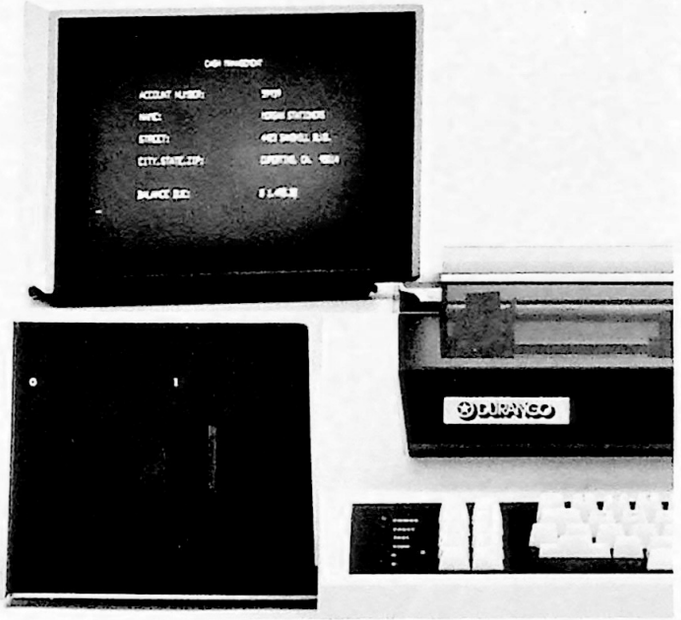
1.5 DISKETTE SYSTEM

The mini-Diskette System provides reliable and inexpensive mass storage of programs and data. Up to .946 million bytes of integral storage capacity is available with 1.89 million bytes total on-line capacity through the use of an auxiliary dual diskette drive.

The Diskette System Features:

- Small size, lightweight design
- Use of 5¼" diskettes
- Drive motor is turned off while diskette is not in use thereby reducing power consumption and extending media life
- Write protect capability
- Expansion to auxiliary drive(s)

Two single sided drives each with a capacity of 473 thousand bytes provides 946 thousand bytes of on line storage. An additional stand alone unit housing two more drives is available as an option bringing the total on-line capacity to 1.89 million bytes.



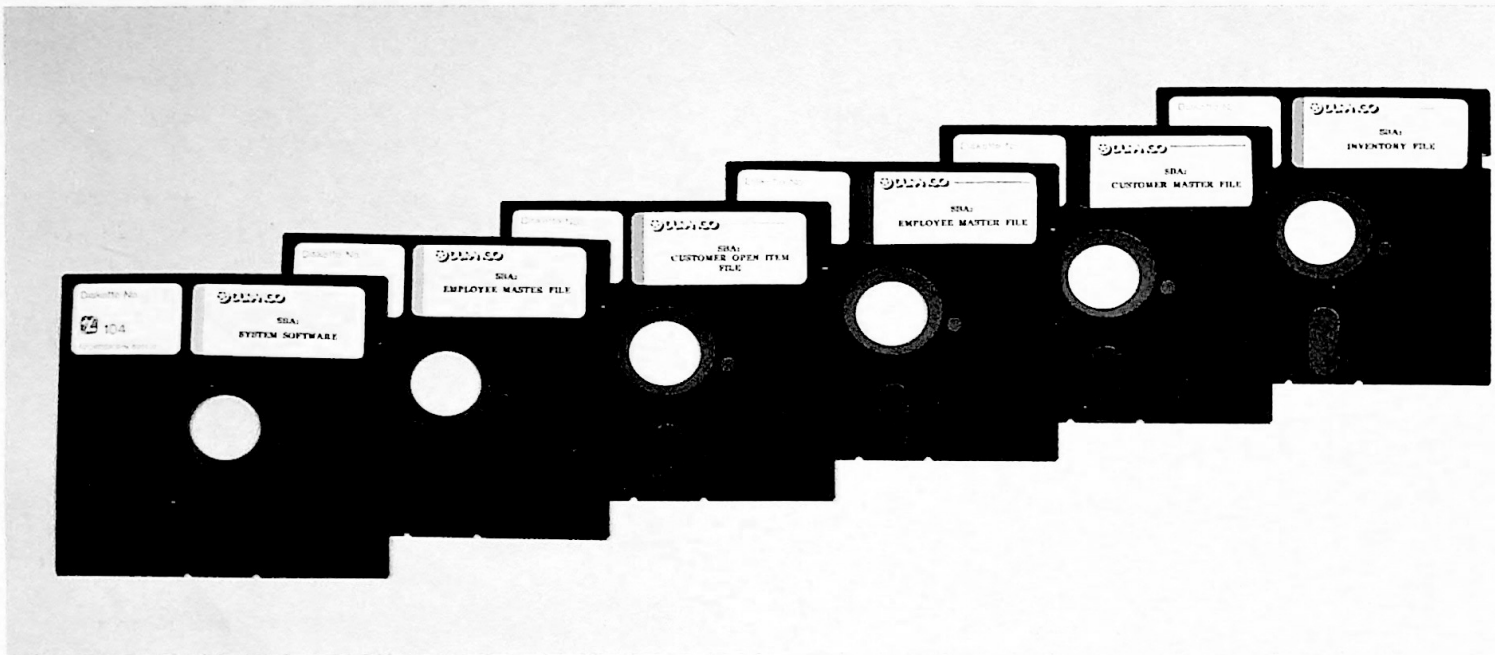
1.6 SOFTWARE

Application Software

The Durango Small Business Applications (SBA) or STAR series turnkey packages are comprehensive pre-written dedicated application programs, such as the SBA General Ledger or Accounts Receivable for a small business. They are comprehensive, easy to use packages that have been proven and adapted for use with the F-85. In addition, they are modular and offer interface compatibility to other modules, within the family.

Communications

As an intelligent terminal, the F-85 is provided with communications software packages emulating popular asynchronous ASCII and synchronous 2780/3780 disciplines. These packages provide networking capabilities with attended or unattended operation.



D-BASIC

D-BASIC is a powerful business oriented, extended version of the traditional BASIC high level language. It provides a powerful tool for the efficient development of specialized programs ranging from commercial to technical applications.

The SBA and STAR series application programs and other Durango applications are written in D-BASIC.

Operating System

The DX-85 Executive Operating System performs system initialization, internal "housekeeping," file management and task monitoring. In addition, it contains the major hardware component drivers.

DX-85 provides the facilities to efficiently utilize all system hardware elements regardless of the application being executed. In addition, it allows the application software to be of a modular design permitting rapid alteration or expansion of user applications.

SECTION 2
OPERATION

Before operating the F-85 you should become familiar with the following procedures essential to system operation. Section 2.1 outlines the system start up procedure; a more detailed discussion of the steps follows.

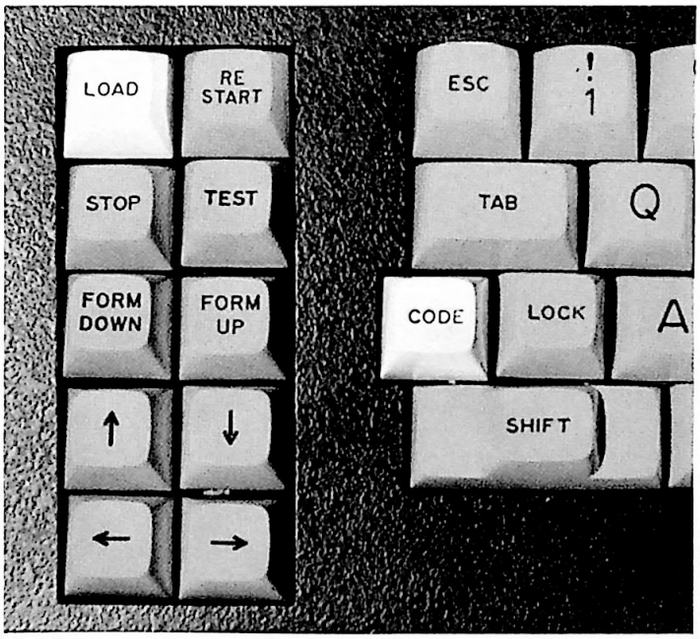
2.1 SYSTEM START UP

(1) Place the POWER switch ON (located at the rear of the F-85)

> **NOTE:**
>
> Always apply or remove power to the F-85 with the diskettes removed from the drives.

(2) Make sure that the STOP and the TEST keys are not depressed.

(3) The DX-85 Operating System is the F-85's control program and is stored on the SYSTEM diskette. It must be read into main memory before the system can be used. To accomplish this, insert the SYSTEM diskette into drive 0 and slowly close the door. Hold down the CODE key and depress the LOAD key.



The indicator above drive 0 will light and remain on until DX-85 is loaded.

(4) DX-85 "signs on" to the VDU screen with:

DX-85 REL XXX VER YY NNK

Where: X is the release level
Y is the version
NN is the memory in thousands (K) of bytes

If this message does not occur or the FAULT indicator lights, refer to the Operator Trouble Shooting chart in Section 3.

(5) Depress the STOP key. If forms are not already loaded in the F-85, perform the loading procedure described in section 2.6.1.

(6) Using the paper positioning keys (defined below), position the paper and set Top-Of-Form (refer to section 2.6.2).

- Form Up - Advances paper one line
- Form Down - Moves paper back one line
- (CODE) Form Up - Advances paper 1/48 inch
- (CODE) Form Down - Moves paper back 1/48 inch
- (CODE) 2 - Sets Top Of Form (TOF) to current paper position
- (CODE) 1 - Advances paper to next TOF (form feed)

---

(7) Release the STOP key.

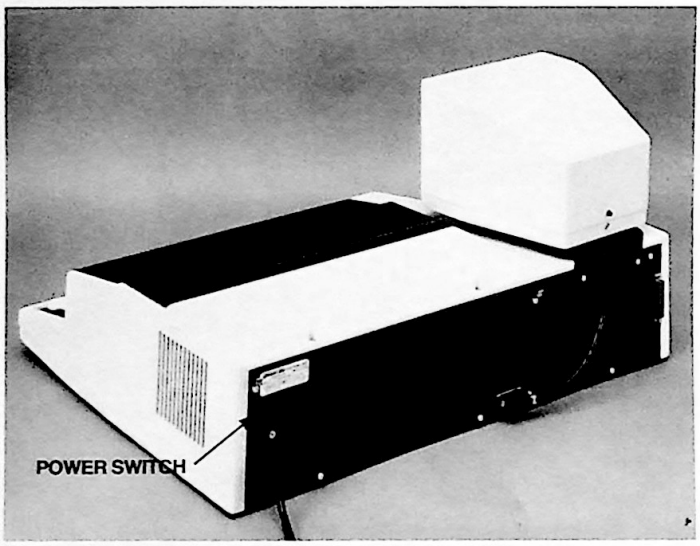
(8) Enter the date and time if requested on the VDU screen.

At this point, operator action is determined by the application program being run and reference should be made to the appropriate operator guide.

Switch on
Load System Disk - drive 0
Hold down Code & then load

2.2 POWER ON/OFF

The power switch is located at the rear of the F-85 (refer to illustration). It is easily accessible when sitting at the machine by reaching to the rear right hand corner and depressing the top half of the switch. Pressing the lower half switches the power off. Be sure the 3 prong power cord is plugged into an AC wall outlet.



The POWER indicator on the keyboard is lit whenever the machine is turned on.

2.3 KEYBOARD

Most entries are made as responses to specific questions or "fill in the blank" type form requests displayed on the Video Display Unit (VDU). Specific information requests depend on the application program being run, but are usually in the form of short responses such as entry of a customer name, quantity purchased, invoice number, etc. All such entries to the system are displayed on the VDU screen for instant operator verification; they do not result in direct printing on the printer.

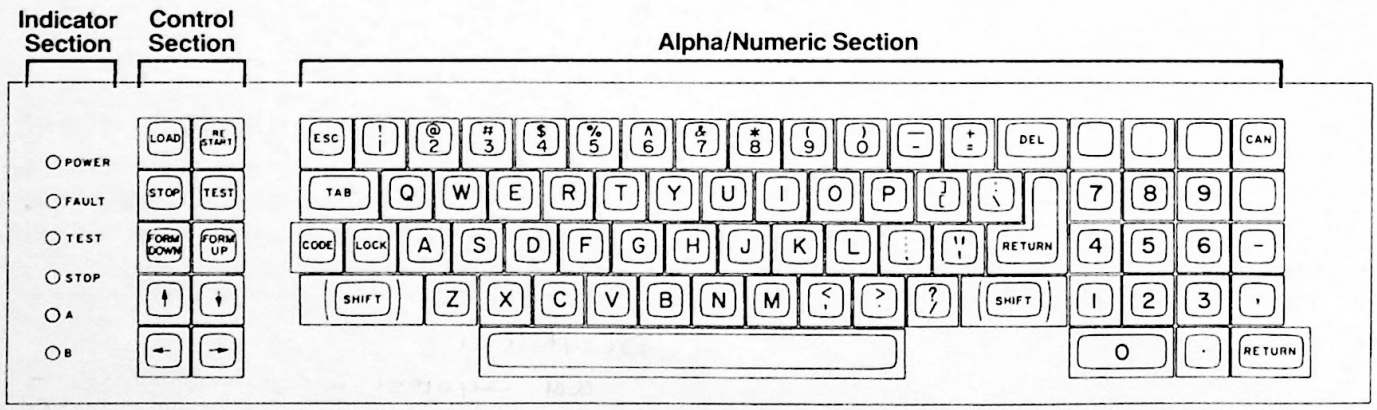
The auto-repeat function is provided on all keyboard keys except the control section LOAD, RESTART, STOP, and TEST keys (be sure not to linger too long on a depressed key unless you **want** it to repeat).

The CODE key is a special function key used in conjunction with other keys to perform various system control. In its use, always depress and hold it down **before** depressing the second key.

Normally all responses to program prompts must end with a RETURN. Depressing the RETURN key tells the system to accept your response and proceed with the program.

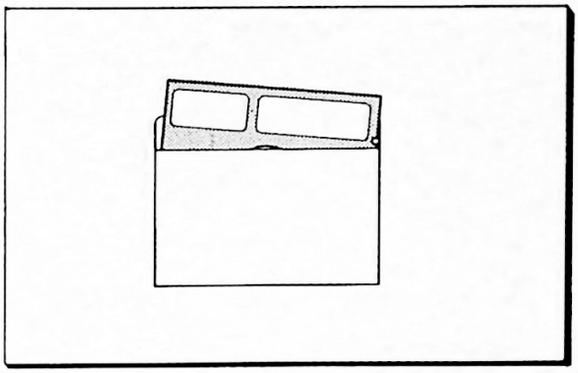
The audible alarm beeps when an error condition occurs. Typically it is used to call your attention to the video display screen.

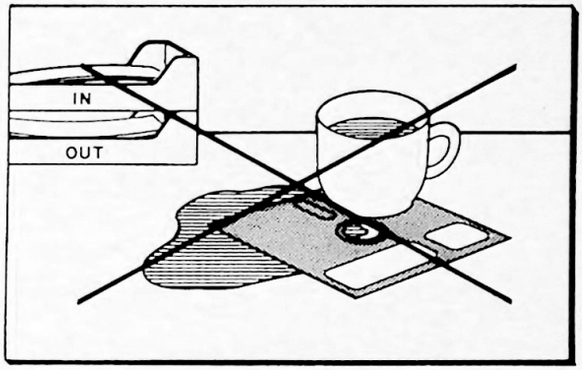
The tables on pages 4-9 and 4-10 provide a quick guide to the functions of the special keys, and indicators on the keyboard.



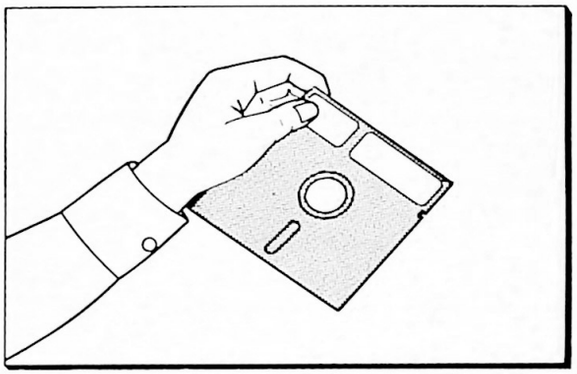
DISKETTE HANDLING

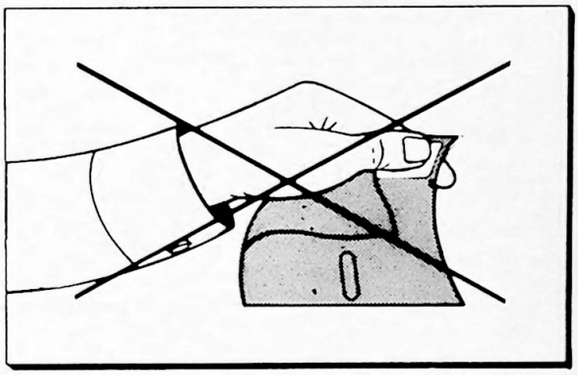
1. PROTECT DISKETTE. Always store in protective jacket.



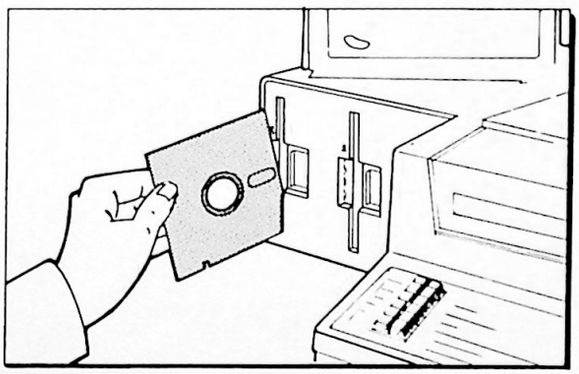


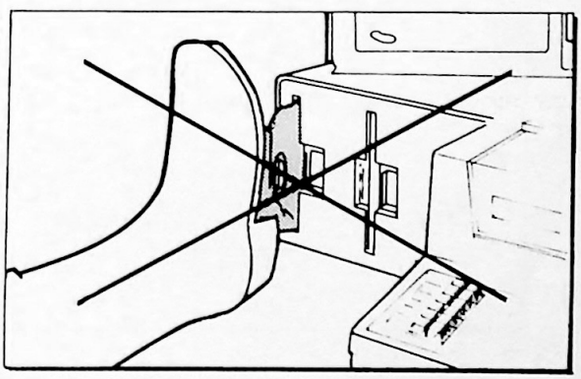
2. HANDLE CAREFULLY. Do not bend.



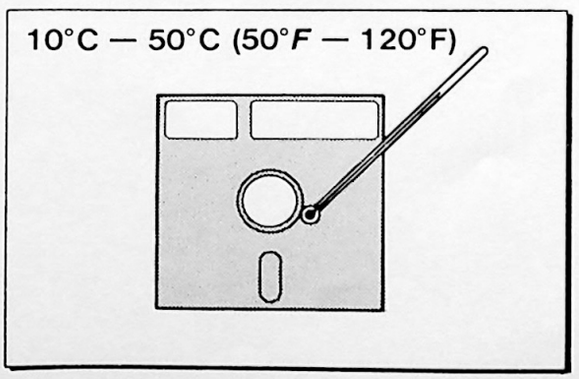


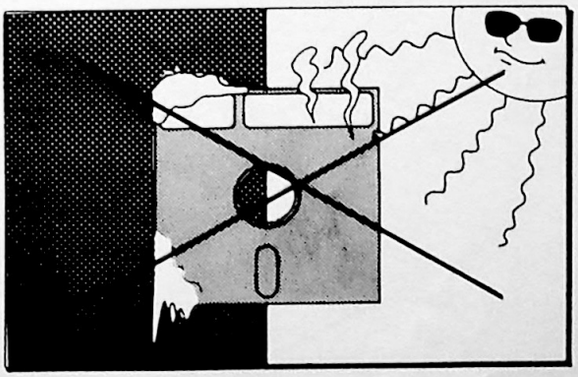
3. INSERT GENTLY.



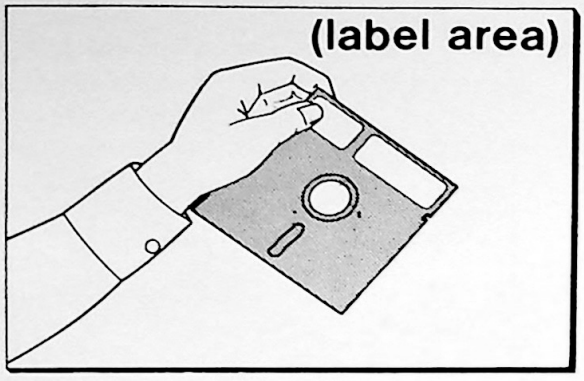


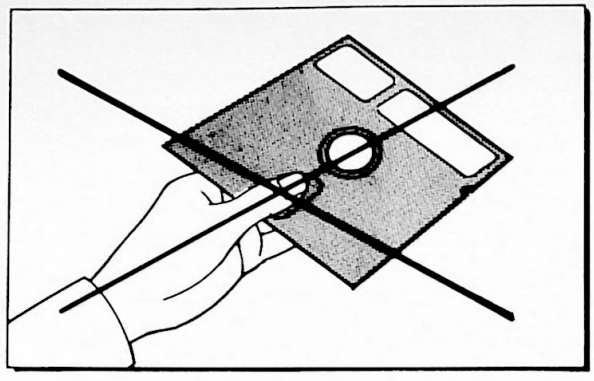
4. PROTECT FROM TEMPERATURE EXTREMES.



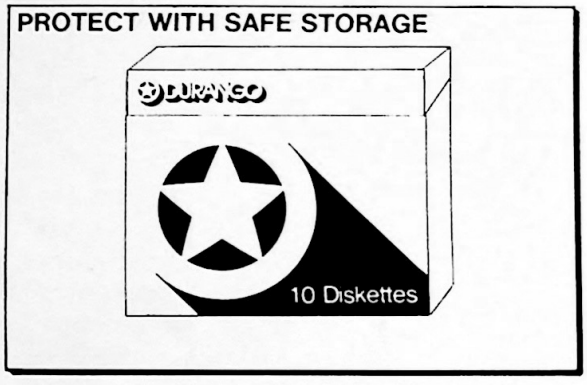


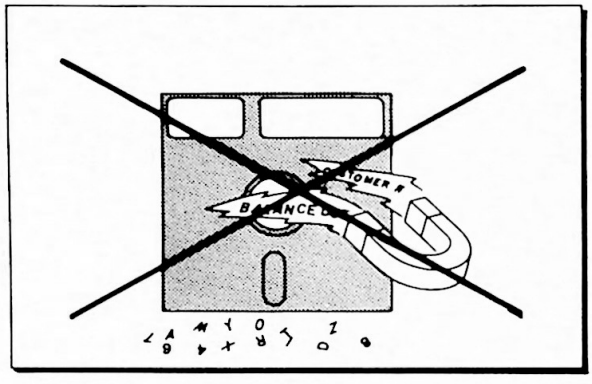
5. DON'T TOUCH MEDIA. Handle by upper corner.



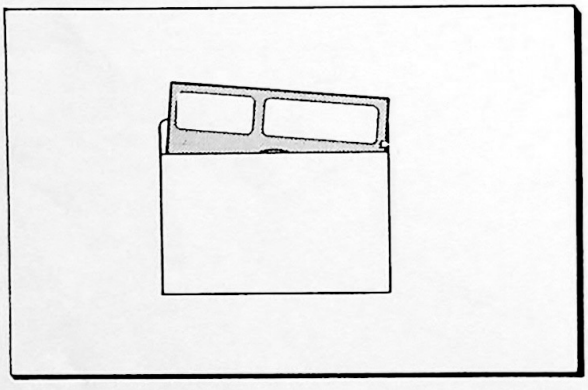


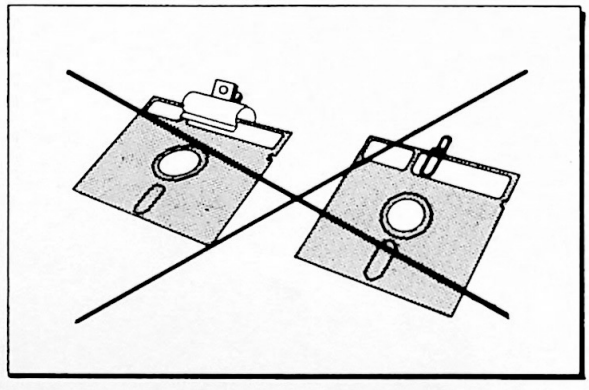
6. AVOID EXPOSURE TO MAGNETISM.



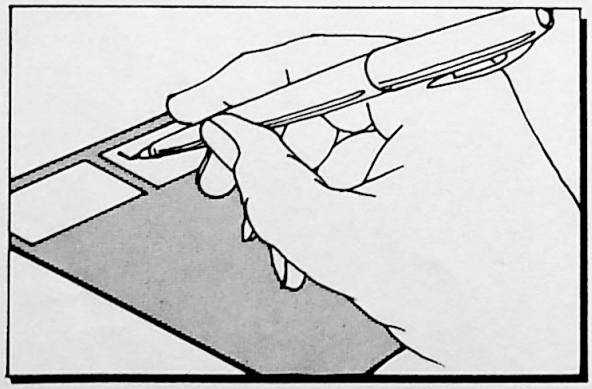


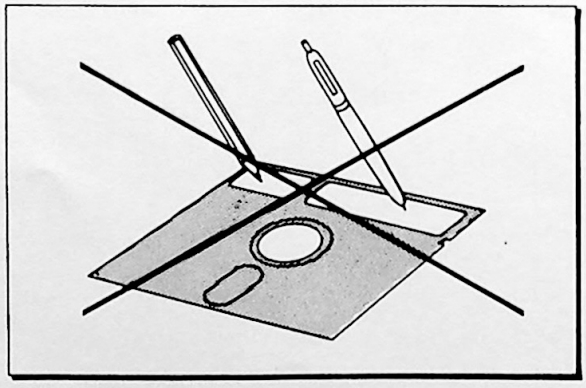
7. DO NOT USE PAPER CLIPS ON DISKETTES.





8. MARK WITH FIBER-TIP PENS ONLY.





2.4 DISKETTE SYSTEM

2.4.1 DISKETTE HANDLING

The mini diskettes are the primary means of storing programs and your companies records in a form usable by the F-85; improper care may cause damage to the diskette and result in considerable time and expense in reconstructing lost files. Always observe the rules in the Diskette Handling illustration to help assure reliable operation.

2.4.2 DISKETTE LOADING

> **NOTE:**
>
> Always apply or remove power to the F-85 with the diskettes removed from the drives.

Following the arrows on the diskette label, insert the system diskette into the appropriate drive (the SYSTEM diskette is always loaded into the left hand drive 0) as shown in the illustration below. A slight click will be heard when the diskette is in position. Close the diskette door by moving the vertical bar on the door all the way to the right (closing the door slowly allows the drive spindle to properly center the diskette).

2.4.3 DISKETTE REMOVAL

To remove the diskette, release the door by again pushing the vertical bar to the right, and allow it to return to the open position. Once open, push the bar to the left to eject the diskette.

The indicators above each door indicate diskette activity. Never open the door to remove a diskette when the light is on.

2.4.4 LOAD ERROR CONDITIONS

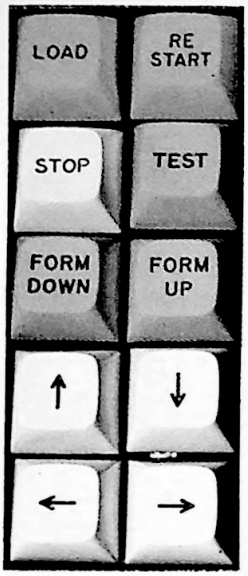
Improper loading of DX-85 results in the FAULT indicator lighting and the audible alarm emitting a short beep. The specific error cause is represented by the state of the four indicators below the FAULT light. Table 2-1 lists these errors.

Table 2-1, LOAD ERRORS

INDICATOR	ERROR CAUSE
TEST	Drive not ready
STOP	Disk read error
A	Disk loader error
B	Disk format error
(none)	Memory parity error.

2.5 VDU

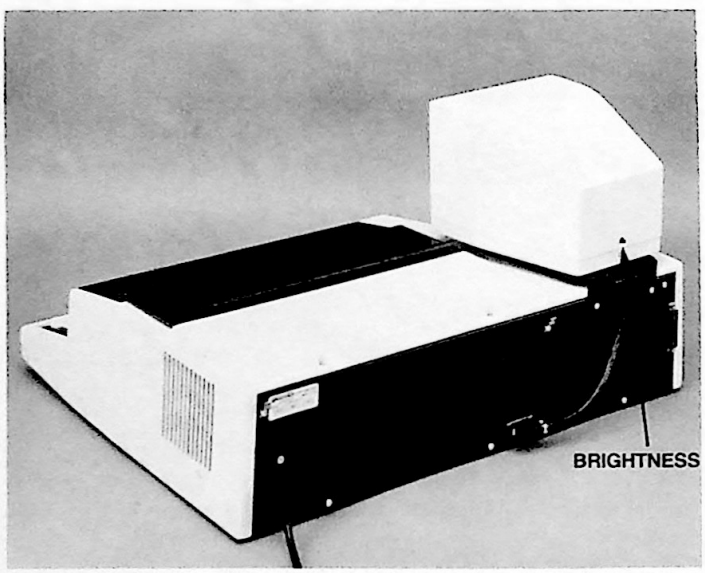
The keys highlighted opposite are the VDU control keys. Display of information output to the screen may be halted by depressing the STOP key. This key is a dual action key: pressing it locks it down; pressing it again releases it. Output resumes when the key is released.



The lower keys (arrows) are used to position the VDU cursor. These keys are used only in writing programs using the EDIT system utility (described in the D-BASIC Reference Manual).

A BRIGHTNESS adjustment is provided at the rear of the display module. It should be set for best visibility of the screen contents.

The video display module is mounted on a swivel base and may be positioned horizontally for the most comfortable operator viewing.

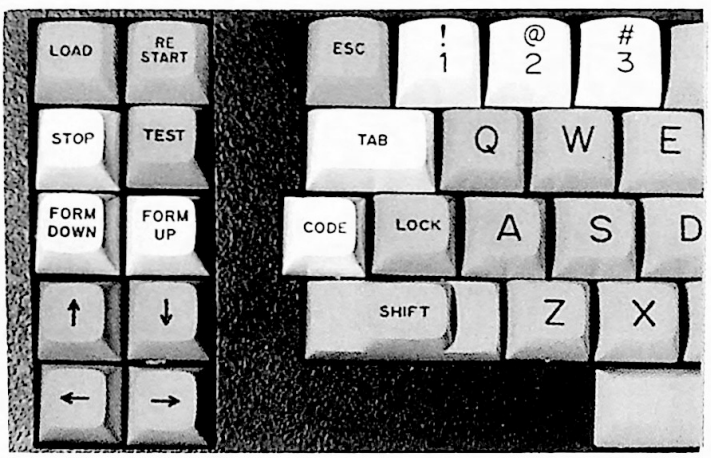


2.6 PRINTER

Normally the application program running automatically sets the machine to the appropriate form length, line length, spacing and font size. The only required operator action is paper or form loading, manual form positioning, and setting the top-of-form.

You will immediately notice there is no platen knob on the F-85 printer. Paper position is controlled by printer control keys located on the left of the keyboard. This provides easy and accurate paper positioning.

The keys highlighted below control the printer.

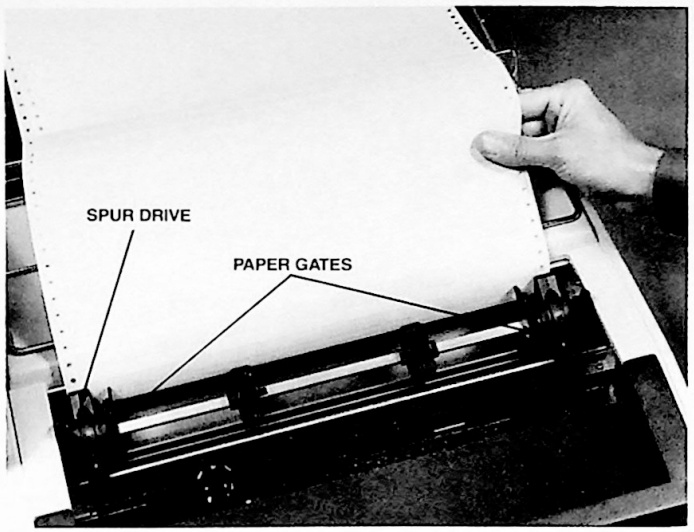


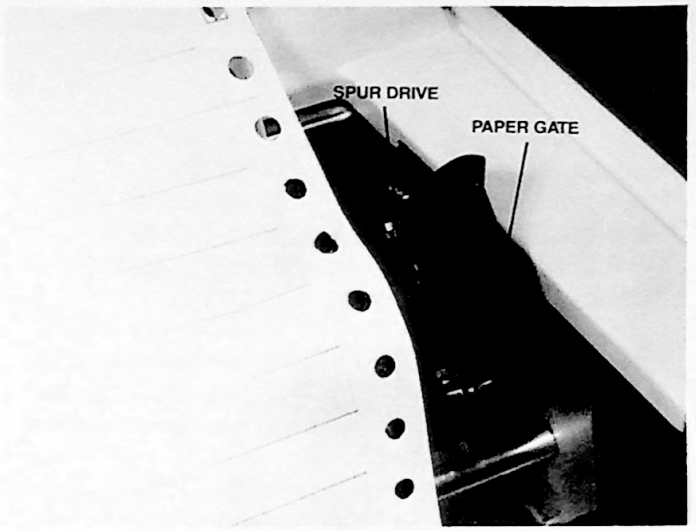
In order to perform any of the following printer operations the DX-85 Operating System must have been loaded as described in 2.1, step (4).

2.6.1 PAPER LOADING

The following forms loading procedure should be performed while seated normally at the machine:

(1) Depress the STOP key. Remove the translucent sound cover and open the paper gates on the two spur drives (see photo above, right). Place the forms over the form feed pins on the spur drives to check correct positioning of the right spur. Refer to 2.6.3 if adjustment is necessary.





(2) If a single part form is used, fold the first sheet over at the perforation so that a double thickness will be fed into the machine. This stiffens the paper making loading easier. If multi-part forms are being loaded, move the red print intensity lever on the printhead clockwise to its last position (parallel to the keyboard). Position the forms so that the holes at the edges are even with the form alignment guidelines at the top of the spur drives. Let the front edge of the form rest on the rear spur drive pins (see photo above).

(3) Make sure the forms are straight by comparing the front edge of the paper to the square drive shaft: they should be parallel.

Repeatedly tap the FORM UP key while allowing the forms to feed in until the spur drive pins capture the paper. Once captured, continue advancing the form.

NOTE:

It may take some practice holding the paper evenly so both sides engage at the same time—if only one side engages, back the paper out by pressing the FORM DOWN key.

As the form emerges above the ribbon, grasp the leading edge near the middle and gently assist upward. Release the FORM UP key when the paper has passed the printhead and over all exposed pins on the front of the spur drives.

(4) Guide the forms over the spur drive pins. Ensure that the pins extend through the holes in the forms. A slight upward pull on the form is necessary to align the holes.

Be sure there is some tension on the forms; this tension controls the paper out switch and may produce a false "PAPER OUT" message on the VDU screen. Inadequate tension is usually an indication the form handlers (spur drives) are too close together.

(5) Close the paper gates. If multi-part forms are loaded, refer to paragraph 2.6.4 for correct print intensity setting. Advance about 6 inches of paper and replace the sound cover.

2.6.2 PAPER POSITIONING AND SETTING TOP OF FORM

Normally paper positioning is automatically handled by the printer's microprocessor, however, when the machine is first turned on for the day, or forms are loaded, the paper must be manually positioned to the top of form and the microprocessor informed. To perform manual paper positioning, first depress the STOP key. This "disconnects" the paper position

feedback device from the microprocessor. Paper may then be manually moved into position as follows:

ACTION	KEYS
Move paper up one line	FORM UP
Move paper down one line	FORM DOWN
Move paper up 1/48	CODE FORM UP
Move paper down 1/48	CODE FORM DOWN
Advance to top of next form	CODE 1

(1) To set the top of form (TOF), position the paper so that the perforations between the forms appear at the base of the small triangular window above the printhead.
(2) Once positioned, hold down the CODE key and then depress the 2 key. Release the STOP key.
(3) If a "PAPER OUT" message is displayed on the VDU, clear it by first holding down the CODE key and then depressing the TAB key.

Once the TOF is set and the STOP key is released, normal form positioning may be performed with the microprocessor keeping track of the forms position. The FORM UP (advance 1 line), and CODE 1 (Form Feed) keys are used to control the forms position.

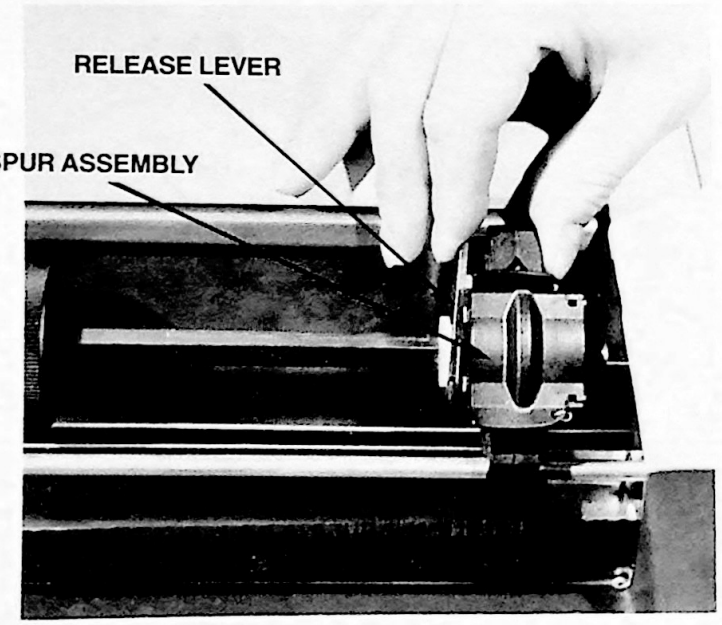
WARNING:

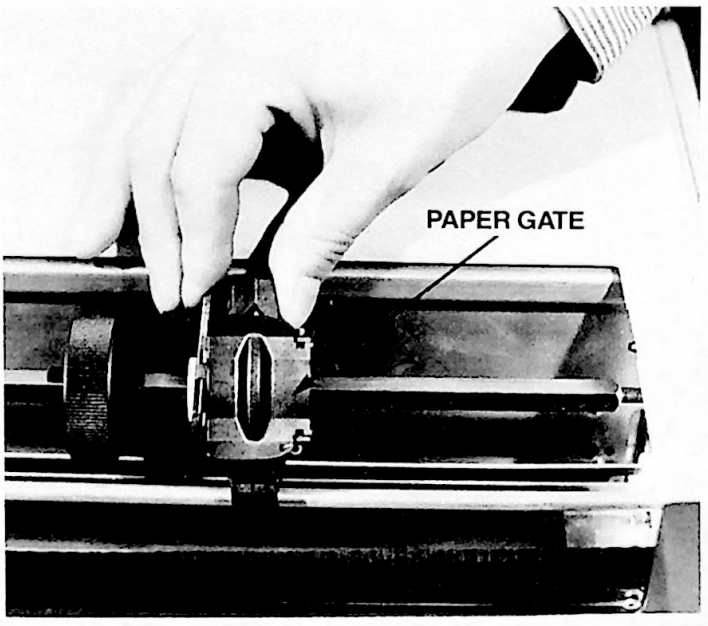
If the TOF (CODE 2) is set and the STOP key is **not** depressed, the next TOF will be set to wherever the paper was when the CODE 2 is issued.

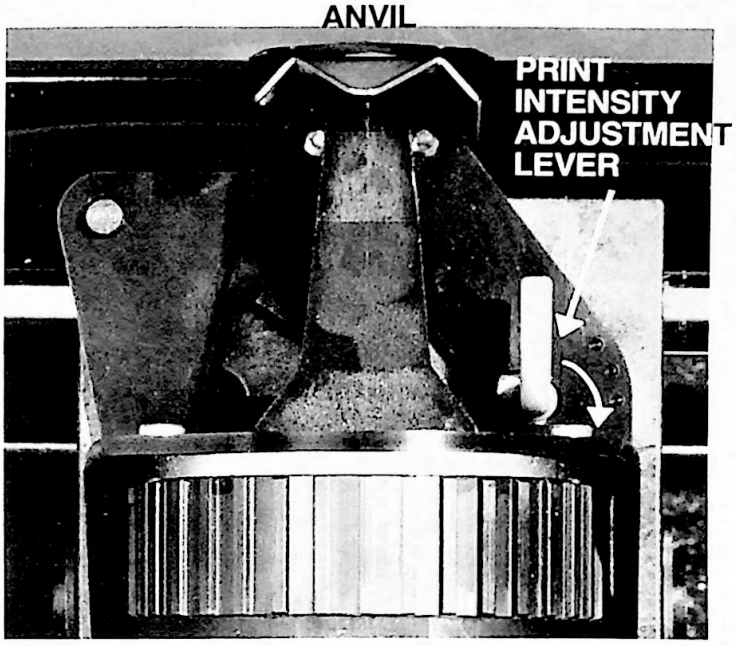
2.6.3 FORM WIDTH ADJUSTMENT

To adjust the F-85 printer for different width forms:

(1) Remove existing forms from the machine. It is usually easiest to tear off the paper as it enters the machine, depress the CODE key and then the 1 key to eject the remaining paper.
(2) The right form handler (spur drive) may then be positioned as desired by grasping (as illustrated in the figures below) and squeezing the release lever while sliding into position. Releasing the lever automatically locks the spur drive onto the shaft.
(3) Open the paper gates and place a new form on the left spur drive pins. Move the right spur to align with the holes on the right side of the paper. (The left spur assembly should normally remain positioned against the drive gear). The new width forms may then be loaded.








```
JMP     GOTO 2

[ Improperly adjusted:
  lever too far back ]


;RELOCATION FACTOR

[Properly adjusted]
```

2.6.4 PRINT INTENSITY ADJUSTMENT

Multiple copy forms up to six parts may be used in the F-85 printer. To maintain the best possible print quality for the forms being used, a print intensity adjustment is provided. This control is located on the printhead carriage assembly (small red lever). There are five positions in its adjustment range (see photo above).

Since there are no standard paper thicknesses for multi-part forms, an adjustment table cannot be provided for reliable results. A general rule however, is to position the print intensity adjustment lever for the approximate number of copies in the form. For a single part form, position the lever closest to the print anvil. For each additional copy, move the lever one more position clockwise. Check the print quality after adjustment to be sure the setting is correct. Broken characters are an indication the adjustment lever must be moved towards the anvil. Moving the lever too far forward with multi-part forms loaded may result in pinching the ribbon. The figure above illustrates adjustment examples.

2.6.5 COPYING THE VDU SCREEN (CODE 3)

As mentioned previously, the printer is automatically activated as required by the application program running. There are, however, times when copying the contents of the Video Display Screen to the printer is desired. To accomplish this, hold down the CODE key and depress the 3 key. All information displayed on the screen is copied to the printer after which normal VDU operation resumes.

2.6.6 TURNING THE PRINTER OFF (STOP)

At any time during its operation, the printer may be stopped by depressing the STOP key. Pressing it again releases the key, and printing resumes until normally terminated. The STOP indicator will blink repeatedly if a program attempts to output to the printer **or** VDU while the STOP key is depressed.

SECTION 3
OPERATOR MAINTENANCE

Because of its integrated design, the F-85 requires a minimum of operator maintenance. There are, however, operator duties which must be performed routinely such as print ribbon replacement and cleaning certain areas of the machine. There are also certain error conditions which the operator may correct, or identify as an aid to maintenance personnel in troubleshooting the machine.

In order to prevent unnecessary machine malfunctions please exercise care in the handling of food, beverages, cigarettes and other materials that may contaminate the machine. If an accidental spill occurs, service personnel should be called to clean and inspect the interior of the unit. It is especially important to avoid placing lit cigarettes and ash trays too near to the diskette drives as contaminants may be drawn into the drives causing diskette errors to occur.

CAUTION:

Because of the velocity of the printer carriage movement, avoid exposing dangling jewelry or ties in this area. The plastic sound cover should be kept on the machine whenever the printer is in use.

Never attempt to remove the main cover from the unit. All necessary routine cleaning can be accomplished by lifting the printer access cover.

3.1 CLEANING PROCEDURE

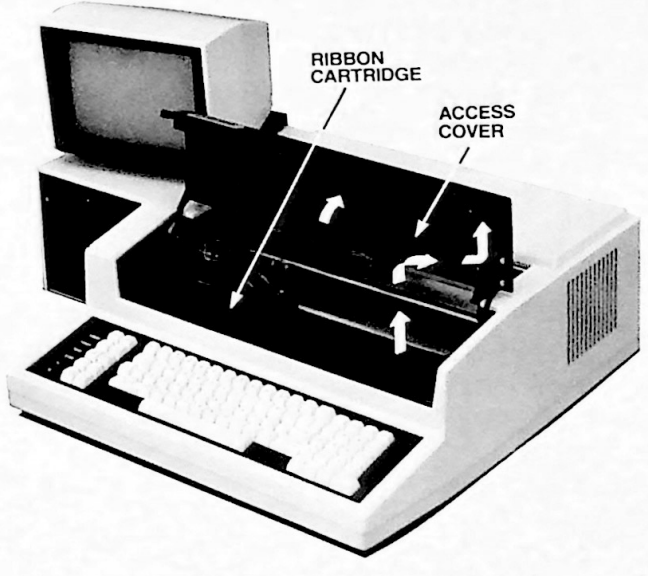
To clean the outside of the F-85, first unplug the machine and use a damp cloth and mild soap. Glass or window cleaner works best on the translucent sound cover and VDU screen.

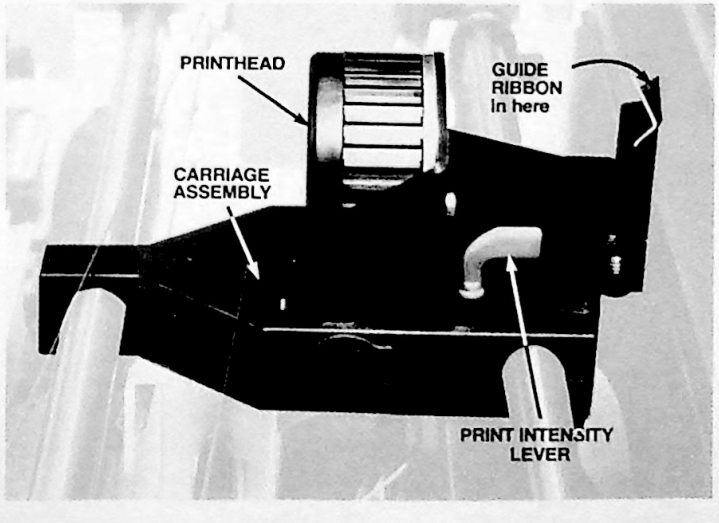
Small paper fragments and dust may accumulate inside of the machine. This accumulation usually occurs below the printhead and ribbon cartridge. To remove this accumulation remove the ribbon cartridge (refer to Section 3.2) and very carefully vacuum the debris out.

3.2 RIBBON CARTRIDGE REPLACEMENT

The ribbon cartridge has a life of approximately 10 million characters, corresponding to at least a months average printing time. When replacement becomes necessary, as evidenced by light or faint printing, perform the following replacement procedure using Durango Printer Cartridge, Model Number 9011:

(1) Remove the sound cover.
(2) Open the access cover by lifting it from the front (see below).
(3) Remove the old cartridge:
   a. Raise the righthand side of the cartridge up and off the ribbon takeup spindle.
   b. Move the cartridge to the right until the cartridge clears the small horizontal guide tab on the left.
   c. Maneuver the cartridge clear of the housing.





(4) Insert the new cartridge:
   a. Manually move the printhead to a position approximately one inch from the far right side of the carriage.
   b. Maneuver the cartridge into place and at the same time guide the ribbon between the ribbon guide and printhead shield.
   c. Engage the cartridge into the horizontal guide tab on the left and into the takeup spindle on the right.
   d. Insure that the spindle engages the cartridge. Take any slack out of the ribbon by manually moving the printhead from right to left.

(5) Check the red print intensity lever for proper adjustment for the forms currently in use.

(6) Close the access cover and replace the sound cover.

3.3 SELF TEST

The F-85 contains a built-in Self Test program that, when executed, establishes the operational status of the system. To execute this test perform the following steps:

(1) Depress the TEST key (see below). This key locks down similar to the STOP key.

(2) While holding the CODE key down, press the LOAD key. The TEST, and B indicators will light indicating the Self-Test has begun. The test is repeated automatically as long as the test key is locked down.

(3) After approximately 30 seconds a successful execution flashes all indicators on. If the TEST key remains locked down, the test automatically restart and the sequence is repeated.

(4) If the test is **not** successful the FAULT indicator lights and an audible beep is heard. The Self-Test is designed to collect specific information about the nature of the test failure. Call your Durango service representative who will instruct you in interpreting specific failure types via indicator pattern (see Table 3-1). This will assist the service personnel in making an accurate preliminary diagnosis and in responding to the problem quickly, and effectively.

(5) If no errors are detected, release the TEST key by depressing it. Normal system initialization can now be performed.

3.4 VDU ERROR MESSAGES AND TROUBLE SHOOTING

Various system error messages may be displayed on the VDU during system operation. Some of them may be cleared by appropriate operator action (see Operator Troubleshooting guide, Table 3-3) while others may indicate a machine malfunction. (Table 3-2 lists these messages together with the probable cause and suggested operator action).

Other error messages related to a particular application are listed in the appropriate operator guide for that application.

Table 3-1, Self Test Indicator Patterns

TEST	INDICATORS LIT
1. PATTERN	TEST, and B
2. I/O BUS	TEST, and A
3. INTERRUPT	TEST, A and B
4. ROM/ROM	TEST, and STOP

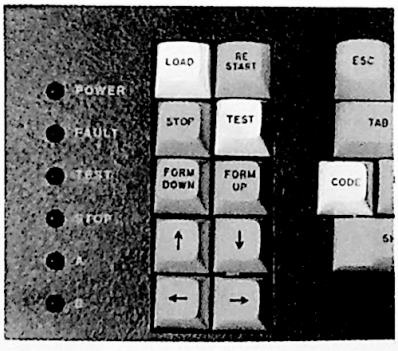


Table 3-2

VIDEO DISPLAY ERROR MESSAGE TABLE

ERROR MESSAGE	PROBABLE CAUSE	OPERATOR ACTION
COVER OPEN	The printer access cover is open.	Make sure the cover is completely closed.
PRINTER JAM	Paper is jammed between the print head and anvil or the ribbon cartridge is defective.	1. Clear paper jam or replace ribbon if defective. 2. Close access cover. 3. While holding the CODE key down, press the TAB key.
PAPER OUT	Printer is out of paper or paper is loaded incorrectly.	Load paper and perform step 3 above.
UNIT n NOT READY	Diskette is not loaded or door is open on Unit n.	Load appropriate diskette or close drive door.
TRAP XX	An internal hardware fault has been detected or the CODE and RESTART keys have been depressed.	Call your service representative if hardware faults are detected. The CODE/RESTART sequence should not be used during normal operation.
DISK ERROR	A non-recoverable diskette error has been detected.	Try backup diskette. If problems persist call service representative.
ILLEGAL COMMAND	No file name specified or file name is too long (more than 10 characters).	Re-enter correct file name.
FILE NOT FOUND	The specified file cannot be located on diskette.	1. Check file name. 2. Check that the correct diskette is loaded. 3. Check to see if the correct unit number has been entered.
RST 1 EXEC	A program fault has occurred.	Record error message data and call software service representative.

NOTES

Table 3-3

OPERATOR TROUBLESHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	OPERATOR ACTION
Fan not running.	1. Power cord unplugged. 2. Outlet dead. 3. Fuse blown.	1. Connect power cord (both ends). 2. Relocate power cord to live outlet. 3. Check and replace fuse if blown. If fuse blows again call your service representative*.
Fan running but POWER indicator is not lit.	Power supply failure.	*Call your service representative.
No video display.	1. Cable to VDU not connected. 2. DX-85 not loaded from diskette. 3. BRIGHTNESS control misadjusted.	1. Connect Cable. 2. Load DX-85. 3. Adjust BRIGHTNESS control.
Video display dim	BRIGHTNESS control misadjusted.	Adjust BRIGHTNESS control.
Initial DX-85 load produces FAULT indicators and an audible beep.	1. Diskette read errors. 2. Wrong diskette loaded. 3. Diskette not loaded or loaded in the wrong drive.	1. Retry or use backup diskette. If symptoms persist record the state of all indicators and call your service representative. 2. Check diskette. 3. Load diskette in drive 0. Refer to Load Error Table 2-1.
Self test produces FAULT indication and an audible beep.	Machine fault.	Record the state of all indicators and call your service representative. Refer to Self-Test Error Table 3-1.

*Unplug the F-85 from AC power outlet

SECTION 4
INSTALLATION

This section covers unpacking, environmental requirements, installation procedures and repacking of the F-85.

4.1 INSPECTION AND UNPACKING

Before unpacking the machine the shipping container should be examined for any obvious damage that may have occurred in transit. If shipping damage is apparent contact the carrier immediately.

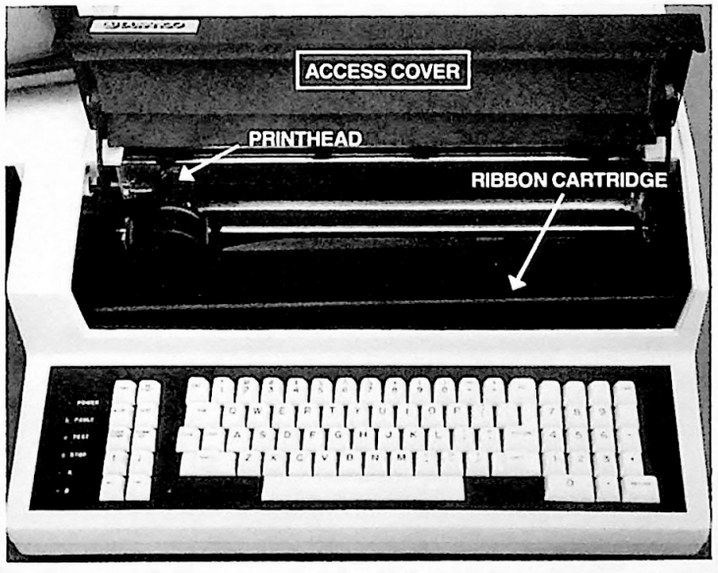
Proceed with the unpacking:

(1) Open the outer box, lift the inner container out by locating its grip holes and lifting out. This works best with two persons.

(2) Check all items as they are removed from the container(s) against the packing list. Check the list of accessories and notify the shipper of any shortages. Save all shipping materials.

(3) Set the machine on a desk or table and inspect for any damages. If damaged contact your Durango representative immediately. Inspect the unit for any foreign material (i.e., packing) that might impair electrical or mechanical operation.

(4) Open the printer access cover, cut and remove the ribbon cartridge tie down. Remove the ribbon cartridge (and green tag).

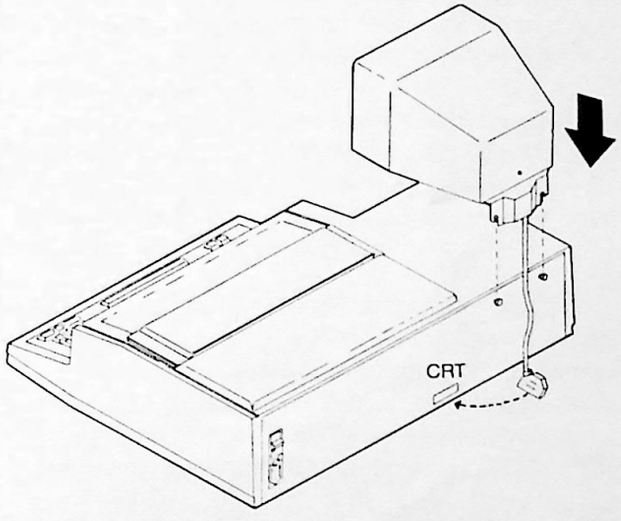


(5) Using a scissor or diagonal cutter, locate, cut and remove the printhead tie wrap.

(6) Move the printhead approximately one inch from the right stop and replace the ribbon cartridge. Refer to section 3 for detailed instructions on ribbon cartridge installation.

(7) Remove any tags or other items attached for shipping purposes.

(8) Install the VDU module by sliding the mounting plate at the rear of the module into the two mounting pegs located at the rear left corner of the machine. Snap the VDU cable into the connector located at rear of the machine.



(9) If the accessory forms stacker is provided, install it per the instructions on page 4-5.

(10) Plug the power cord into the rear of the unit. Be sure to read the following section before connecting the power cord to a wall socket.

4.2 SYSTEM REQUIREMENTS

The F-85 has been designed to operate in a wide range of environmental conditions. It has been ruggedly designed; however it is a highly sophisticated electronic instrument and care must be taken in ensuring that it is installed in a clean area and operated within the environmental limits specified in the following paragraphs.

Space Requirements

The F-85 may be placed on any existing desk, table, or typing stand, however, it should be sturdy and capable of supporting at least 100 pounds. A table surface approximately 27 inches above the floor is recommended for comfortable operation of the machine. Avoid locating the machine in direct sunlight or near heat producing devices or vents. Provide a clear area to the right side of the F-85 where the exhaust fan is located. Placing books or other objects near this area can block the air exhaust and result in machine malfunctions.

Operating Environment

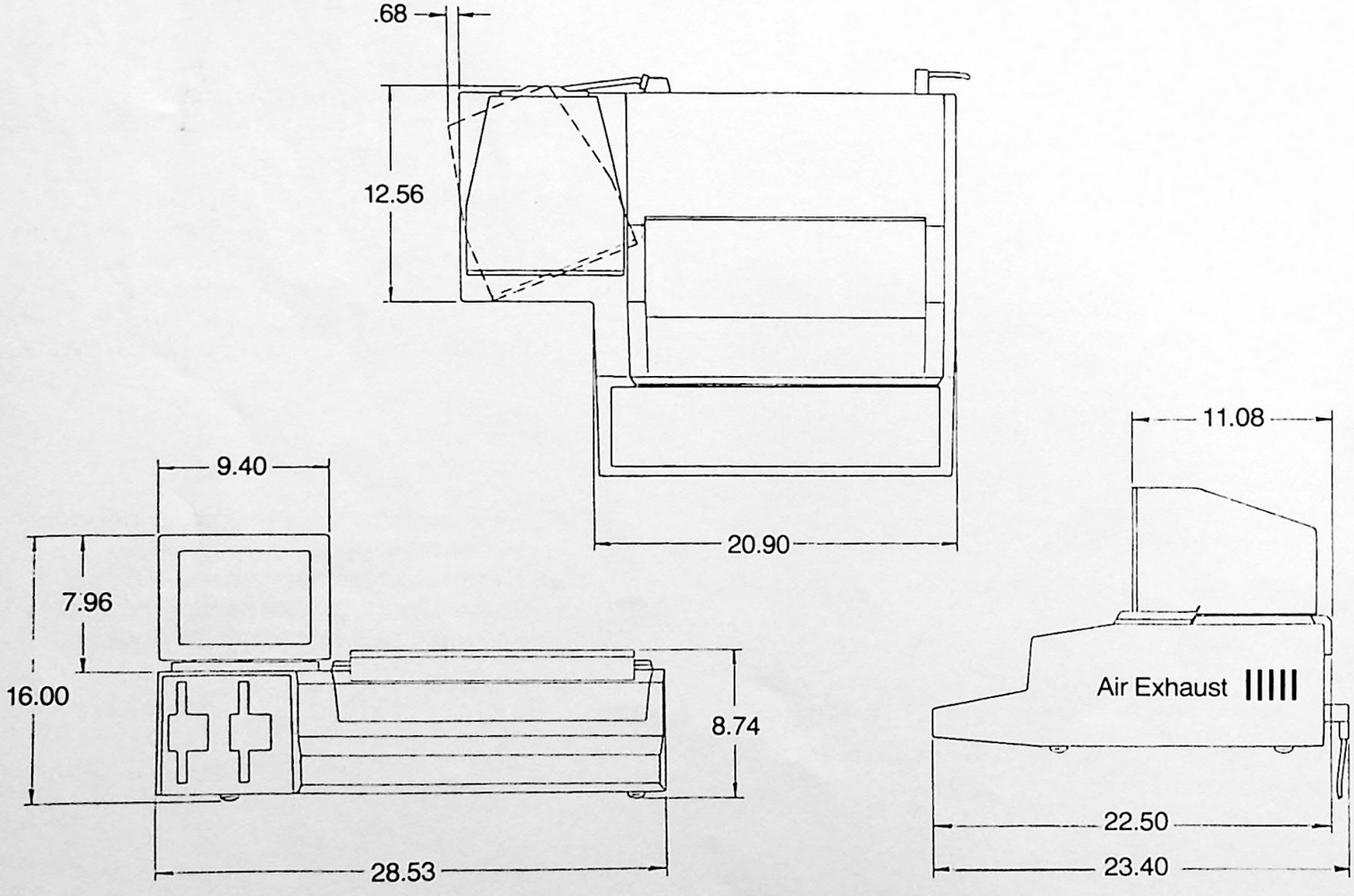
Table 4-1 defines the F-85's minimum and maximum operating and storage environmental limits.

Table 4-1. Environmental Limits

SPECIFICATION	OPERATING	STORAGE
Temperature Range (Degrees Fahrenheit/Celsius)	min 50/10 max 95/35	−40/−40 150/65.5
Relative Humidity Range (At 80° F. Maximum wet bulb temperature, no condensation)	min 20% max 80%	10% 90%
Altitude Range	min Sea level max 10,000 ft./3048m	Sea Level 25,000 ft./7620m

F-85 Physical Dimensions

All dimensions are in inches



Weight

The F-85 weighs 65 pounds (29.6 kg.) including the VDU module.

Power Requirements

Table 4-2 defines the power requirements for the F-85. The unit has two operating voltage ranges centered nominally at 115 or 220 volts. Maximum power consumption is 250 watts.

Table 4-2, Power Requirements

SPECIFICATION	LIMITS
220 Volt Range	186–264 Volts AC
115 Volt Range	90–132 Volts AC
Frequency	47–63 Hz

4.3 INSTALLATION PROCEDURES

Installation of the F-85 consists of performing a series of operational tests prior to running actual application programs. You should also be familiar with diskette handling and loading, keyboard operation, and paper loading which are described in the Operation section of this manual. Before proceeding, the unpacking instructions detailed in section 4.1 must have been performed. You may then proceed as follows:

(1) Plug the AC power cord into a convenient wall outlet.

(2) Turn the machine ON by depressing the top half of the ON/OFF Switch located at the rear of the machine on the right side. Normal power up indications are:

- The exhaust fan is running
- The keyboard POWER indicator is lit
- The printer carriage moves (or stays) to the left
- No abnormal sounds, odors, or movements are present

If any conditions exist other than those above, immediately turn off the machine and unplug from the power outlet. Refer to the Trouble-shooting chart in this manual or contact your service representative.

(3) Run the internal Self Test by depressing the TEST key on the keyboard and then, depress the CODE key and the LOAD key. (You do not have to hold these keys down once the test has begun). The test requires approximately 30 seconds to run through one pass and continues to repeat until the TEST key is released. Normal operation is determined by observing the five indicators below the POWER indicator. Upon test initiation, the TEST indicator lights and remains lit for the duration of the test. As the test proceeds the STOP, A, and B indicators flash. At the end of each pass all indicators will flash momentarily before the test is repeated. If an error occurs an audible alarm sounds and the FAULT indicator lights. If an error occurs or if the test does not proceed as described above, recheck to make sure you followed the correct procedure. If the error persists contact your service representative.

Let the test run for at least 2 minutes (approximately 4 passes), then release the TEST switch. At the end of the current test pass, all of the indicators will light and remain lit indicating that the test has run successfully.

(4) Place the Self Assurance diskette in Unit 0 (left slot) and perform the initial system loading by holding the CODE key down while depressing the LOAD key. The F-85 should then load a program from the diskette which results in the following message being displayed on the VDU:

DIAG REL X VER Y NNK

where: X is the release level
Y is the version
NN is the memory in thousands (k) of bytes

If the above message does not occur refer to the Operator Trouble Shooting Guide on page 3-5.

(5) Load paper into the printer and position the paper to the top of the form by following the instructions in the Operation section (2.6.2).

(6) Run the System Assurance Test by typing in the test name, SATEST followed by a RETURN. A comprehensive series of tests are then run which automatically check out all elements of the F-85. The test results are printed out and displayed on the printer and VDU respectively. If the test runs successfully, the following message is displayed on the VDU:

NO ERRORS. SATEST PASSED

If it fails the following message is issued to the VDU:

(error listing)
SATEST FAILED

With the following listed on the printer:

SATEST FAILED
(error list)

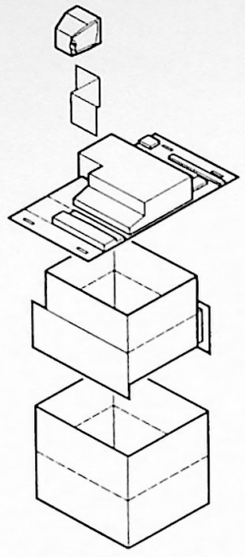
Call your service representative and give him the specific failure messages to aid in diagnosing the failure.

(7) If the SATEST is successful in step 6 remove the diskette from unit 0 and place it in Unit 1 (right slot). Type in the test name SATEST/1 followed by RETURN. This repeats the test using in diskette drive 1. Follow the procedure in step 6 if a failure occurs.
(8) If step 7 is successful, the F-85 is fully operational and ready for use.

4.4 REPACKING FOR SHIPMENT

To repackage the F-85 for shipment the original packing material* and shipping carton should be used. Perform the following steps:

(1) Remove the VDU module from the F-85 by first unplugging it and then lifting it off of the two mounting pegs. Wrap the VDU in packing material. Make sure the cable is tucked under the swivel plate. Insert the VDU into the cardboard holder with the display screen facing to the rear.
(2) Unplug the power cord from the machine and wrap in packing material.
(3) Remove the sound cover and wrap it in packing material, and place over keyboard.



(4) Lift the printer access cover and remove the ribbon cartridge.
(5) Move the print head to the far left stop and strap it to the ribbon bracket.
(6) Replace the ribbon cartridge and strap it to the carriage rails on the right side.
(7) Place the machine in the plastic bag supplied with the original container.
(8) Place the machine on the cardboard inner liner with the bottom rear edge of the machine resting on the long foam strip.
(9) Place the VDU in the opening at the left of the keyboard with the display screen facing the diskette drives.
(10) Lift the inner liner by the hand holes and place it inside of the inner box of the shipping container.
(11) Place the wrapped sound cover on top of the keyboard with the front facing the printer.
(12) Place the wrapped power cord between the sound shield and the front of the inner box.
(13) Fold the top of the inner jacket and close the flaps on the inner box.
(14) Tape securely the flaps of both the inner and outer boxes.

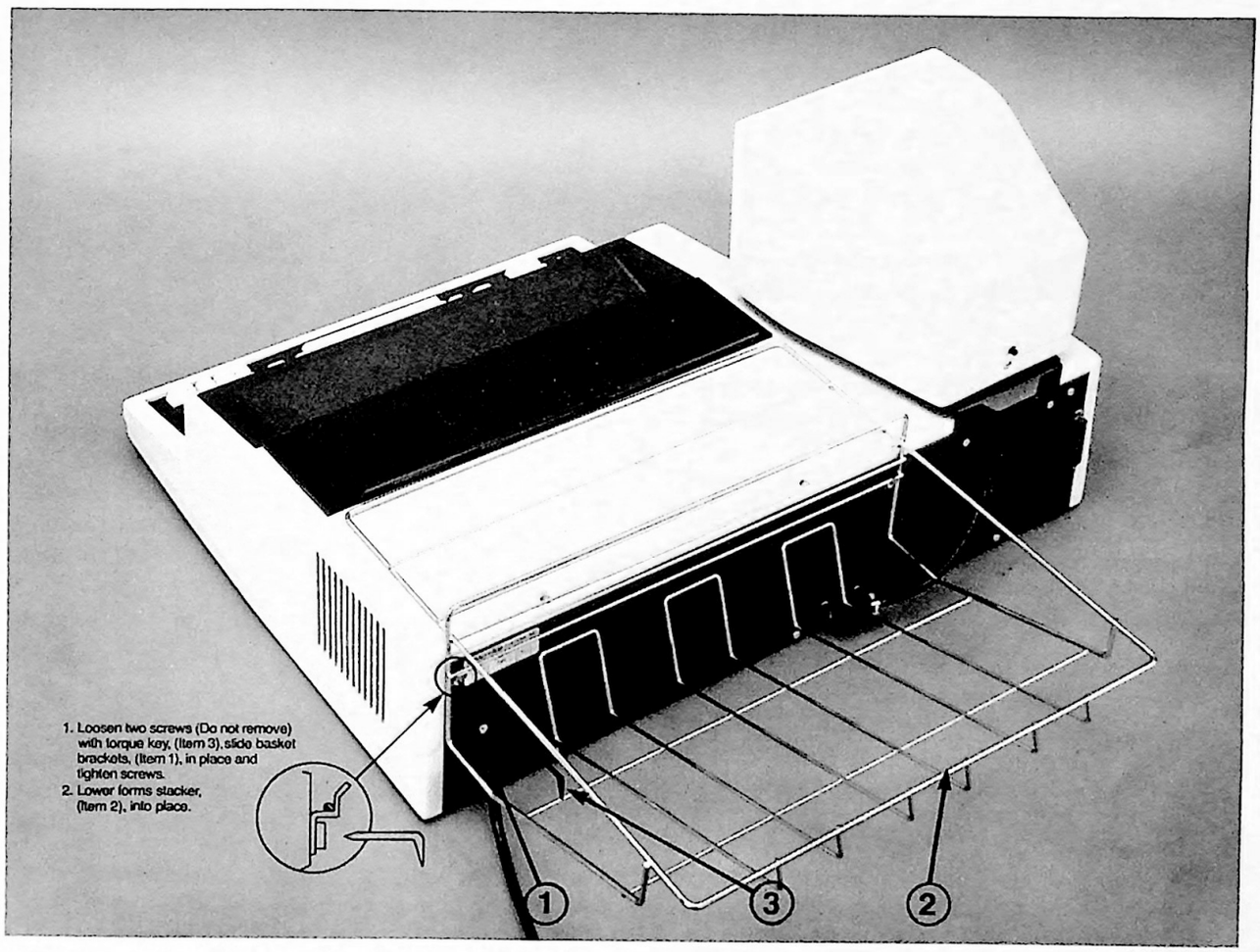
*The shipping material is normally bubble wrap. If this is not available, a substitute may be used. It should have good resiliency and cushioning characteristics to insure a snug fit and adequate protection.

4.5 ACCESSORIES/SUPPLIES

The following accessories and supplies are available from your dealer and may be ordered using the listed model number:

FORMS STACKER	Model 9101
RIBBON CARTRIDGE	Model 9011
BOX OF 10 DISKETTES	Model 9012
DISKETTE STORAGE BOX	Model 9013

Several Additional F-85 options and features are available. Check with your dealer for a complete list of these items.


1. Loosen two screws (Do not remove) with torque key, (Item 3), slide basket brackets, (Item 1), in place and tighten screws.
2. Lower forms stacker, (Item 2), into place.
1
3
2

GLOSSARY OF TERMS

APPLICATION PROGRAM	A program dedicated to performing a specific end-user function such as Accounts Receivable, Payroll, etc.
CODE-LOAD	Refers to the procedure for initializing the F-85 from power up. See page 2-1.
CURSOR	The small horizontal blinking line on the VDU screen. Its position indicates where the next character typed will be entered.
D-BASIC	Durango's extended business oriented version of the standard BASIC programming language.
DX-85	The primary control program required by the F-85 for operation. Also referred to as the "Operating System", DX-85 is stored on the SYSTEM diskette and must be loaded into main memory prior to machine use. This procedure is accomplished with the "CODE LOAD" sequence.
FORMS ALIGNMENT GUIDELINES	Notches at the top of the F-85 printer's form handlers (spur drives) used to assist in form loading. See page 2-10.
OPERATING SYSTEM	The F-85's control program required for a computer system's operation. See also DX-85.
PRINT ANVIL	The hard rubber bar behind the printer ribbon functionally equivalent to a conventional platen. See page 2-9.
PRINT INTENSITY	An adjustment on the F-85's printer used to set the print impact pressure to the number of form parts used. See section 2.6.4.
SELF TEST	The F-85's built-in test program. It is executed to establish the operational integrity of the system. See section 3.3.
SPUR DRIVES	The built in form handling mechanisms in the F-85 printer. They are adjustable to allow the use of various width forms. See section 2.6.3.
TOP OF FORM	The leading edge of the form in the printer with respect to the print head window. See also section 2.6.1.

VDU ..... Video Display Unit. The display screen module used for primary operator prompts and feedback.

WRITE PROTECTED ..... A condition whereby the writing of information to a diskette is prevented. It is accomplished by placing a small foil tab over the write protect notch in the side of the minidiskette. Without it, normal data recording to the diskette occurs. Normally used to protect valuable diskettes from accidental erasure.

Table 2-1, KEY AND INDICATOR DEFINITIONS

INDICATOR SECTION

INDICATOR	FUNCTION
POWER	Indicates the presence of system power.
FAULT	Indicates a machine fault during initial Operating system loading or during the Self Test.
TEST	Indicates that the Self Test is in operation (used in conjunction with the TEST switch). Also used to indicate error status during initial Operating System load.
STOP	Blinks whenever the STOP key is depressed and a program attempts to output information to the VDU or printer.
A & B	Indicator A blinks whenever diskette activity occurs during normal operation. Also, both A and B indicate specific conditions during initial Operating System loading or TEST operation.
Audible Alarm	An audible alarm which may be programmed for a short beep. It is normally used to indicate error conditions.

ALPHA-NUMERIC SECTION

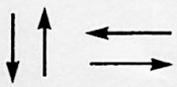
KEY	FUNCTION
ESC *	Escape. This key is used only for program development. Its use is detailed in the D-BASIC Reference Manual.
DEL	Delete. This key deletes the last character entered and automatically baskspaces one position.
CAN	Cancel. This key is used to delete all characters which have been made in a display field and allow re-entry from the beginning.
RETURN	Similar to a conventional carriage return. Normally all data entries are followed by a RETURN. The second RETURN at the lower right hand corner of the numeric keypad is provided for convenience when entering numeric data.
TAB	Normally used for program development under the EDIT utility.
CODE	This key is used in conjunction with other keys to perform various system functions such as printer form adjustment, system initialization, etc. Its use is detailed in Diskette and Printer operation sections.

Operation of all other keys is identical to that of a conventional typewriter.

*DO NOT USE. For diagnostic use only.

Table 2-1 (cont.)

CONTROL SECTION

KEY	FUNCTION
LOAD	Used in conjunction with the CODE key to load the DX-85 operating system from diskette into main memory. This procedure initializes the F-85 following power turn-on.
RESTART ...	This key is used for program development and is not used in normal operation.
STOP	Used to halt the displaying of data to the VDU screen, or operation of the printer. This is a dual action key: pressing it once locks it down; pressing it again releases it and normal operation resumes. The STOP indicator blinks whenever the STOP key is locked down and a program attempts to output to the VDU or printer.
TEST	Used to execute the F-85's built in Self Test. Refer to the Self Test in the Operator Maintenance Section.
FORM DOWN	Used to move paper or forms in the printer back one line. When used in conjunction with the CODE key, paper is backed out 1/48 inch. (STOP key must be locked down)
FORM UP ...	Advances paper or forms in the printer by one line. When used in conjunction with the CODE key, paper is advanced 1/48 inch.
	Video Display Cursor positioning keys. Keys move the cursor in the direction of the arrow. These keys are not normally used by application programs.

*DO NOT USE. For diagnostic use only.